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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,265	10/05/2004	Hee Young Kim	644P002	1627

42754 7590 08/07/2006

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EXAMINER	
VANOY, TIMOTHY C	

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/510,265	KIM ET AL.	
	Examiner	Art Unit	
	Timothy C. Vanoy	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☒ Claim(s) *4,7 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/13/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

In this application, the abstract is not in the form of a single paragraph.

Claim Objections

a) In claim 4, "0.5 ~ 5.0" should be replaced with "0.5 ~ 5.0:1".

b) Claim 7 does not end with a period.

c) In claim 8, "g/.l." should be replaced with "g/l."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,610,135 to Ohmori et al. in view of the article titled "Preparation of

Monodisperse ZrO_2 by the Microwave Heating of Zirconyl Chloride Solutions" by Young Tae Moon and the article titled "Preparation of Monodisperse and Spherical Zirconia Powders by Heating of Alcohol-Aqueous Solutions" by Young Tae Moon et al.

Col. 1 ln. 58 to col. 2 ln. 2 in U. S. Patent 6,610,135 B1 describes a method for making a titania sol by hydrolyzing titanium tetrachloride in an aqueous solution in the presence of a carboxylic acid so as to produce sol of titanium-containing fine particles having an average diameter of 0.8 to 50 nm. Col. 3 lns. 17-25 reports that the concentration of titanium tetrachloride in the aqueous solution ranges from 0.1 to 6.5 moles/Liter, and col. 3 lns. 48-53 reports that the hydrolysis of the titanium tetrachloride is conducted at a temperature ranging from 50 °C to the boiling point of the aqueous solution of the titanium tetrachloride. Col. 4 ln. 63 to col. 5 ln. 3 sets forth that a stabilizer can be incorporated into the aqueous liquid prepared by hydrolysis so as to prevent coagulation of the aqueous liquid or aqueous sol. Col. 5 ln. 66 to col. 6 ln. 5 sets forth that the process may be continuous with a single reaction vessel employed as a continuous reactor.

The difference between the applicants' claims and U. S. Patent 6,610,135 B1 is that the applicants' claims are specifically drawn to the production of a zirconia sol whereas the process of U. S. Patent 6,610,135 is drawn to the production of a titania sol, however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because titanium and zirconium belong to the same chemical group in the Periodic Table and elements within

the same chemical group in the Periodic Table are known to have similar chemical and physical properties and are, therefore, submitted to be obvious variants of each other.

The difference between the applicants' claims and U. S. Patent 6,610,135 B1 is that the applicants' claims are drawn to the microwave heating of the zirconium salt solution, whereas the disclosure set forth in col. 3 lns. 50 et seq. in U. S. Patent 6,610,135 B1 does not expressly set forth the use of microwaves to heat the zirconium salt solution.

The abstract of the Moon et al. article "Preparation of Monodisperse ZrO_2 by the Microwave Heating of Zirconyl Chloride Solutions" sets forth that microwaves are an excellent means of uniformly heating a zirconyl chloride-containing solution to provide zirconia particles in a rapid fashion so as to produce mondisperse and spherical zirconia particles.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the process described in U. S. Patent 6,610,135 B1 by heating the zirconium salt solution with microwaves, as required by the applicants' claims, because the abstract of the Moon et al. article "Preparation of Monodisperse ZrO_2 by the Microwave Heating of Zirconyl Chloride Solutions" sets forth that microwaves are an "excellent" means for rapidly and uniformly heating a zirconium salt solution to obtain monodisperse and spherical zirconia particles.

The difference between the applicants' claims and the disclosure of U. S. Patent 6,610,135 B1 is that applicants' claim 4 calls for the use of a mixture of water and

alcohol as the solution for zirconium salt (whereas the process of U. S. Patent 6,610,135 B1 does not appear to use an alcohol in their solvent).

The abstract of the Moon et al. article "Preparation of Monodisperse and Spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions" sets forth a process for preparing zirconia powders from a solution of zirconyl chloride (please also see "II. Experimental Procedure") wherein when an alcohol was added to the water solvent the resulting particles had a narrow particle size distribution.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of U. S. Patent 6,610,135 B1 by preferentially including an alcohol with the water solvent for the zirconium salt, in the manner set forth in applicants' claim 4, because the abstract of the Moon et al. article "Preparation of Monodisperse and Spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions" fairly suggests that the inclusion of the alcohol in the solvent will result in a narrow particle size distribution for the product zirconia.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application No. 10-510,264 in view of the article titled "Preparation of Monodisperse ZrO_2 by the Microwave Heating of Zirconyl Chloride Solutions" by Young Tae Moon et al.

The claims of 10-510,265 and 10-510,264 disclose obvious variations of the same method for continuously preparing a zirconia sol by heating a solution of zirconium salt (which may be zirconyl chloride: please see claim 4 in both 10-510,264 and 10-510,265) in a reactor.

The difference between the claims of 10-510,264 and 10-510,265 is that the claims of 10-510,265 are specifically drawn to microwave heating of the solution, whereas the claims of 10-510,264 only call for heating the solution.

The abstract of the Moon et al. article sets forth that microwaves are an excellent means of uniformly heating a zirconyl chloride-containing solution to provide zirconia particles in a rapid fashion so as to produce mondisperse and spherical zirconia particles.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process described in the claims of 10-510,264 by heating the zirconyl chloride-containing solution with microwaves, in the manner required by the claims of 10-510,265, because the abstract of the Moon et al. article sets forth that microwaves are an "excellent" means of uniformly and rapidly heating a zirconyl chloride-containing solution.

This is a provisional obviousness-type double patenting rejection.

The following references are made of record:

U. S. Patent 5,037,579 disclosing the hydrothermal process for producing a zirconia sol, and

U. S. Patent 4,816,239 disclosing a process for producing zirconium sols.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 571-272-8158. The examiner can normally be reached on Mon-Fri 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Timothy C Vanoy
Primary Examiner
Art Unit 1754

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